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RESEARCH ARTICLE

The role of the entrepreneurial university in building an entrepreneurial ecosystem in a post conflict economy: An exploratory study of Rwanda

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Abstract

The purpose of this paper is to examine the role of the entrepreneurial university in supporting the development of the entrepreneurial ecosystem in a post conflict, transitional economy. We developed a cross case analysis to identify common themes and patterns in the data. Our findings demonstrate that in a post conflict, transitional economy entrepreneurial universities entrepreneurial ecosystem development is constrained by a number of institutional factors including, *structures, systems, leadership, strategies, and culture*. We further identify that, when an entrepreneurial ecosystem system has been destroyed during conflict, these constraints present significant challenges to the evolution of the entrepreneurial ecosystem post conflict. Second, in a departure from other studies, our findings also outline the role of the entrepreneurial university in the unique evolution of the post conflict entrepreneurial ecosystem in Rwanda. We identify that the entrepreneurial ecosystem evolves through a number of stages including, *embryonic, destruction, formation, and capacity building stages*.

KEYWORDS

conflict, entrepreneurial ecosystems, entrepreneurial university, Rwanda, transitional economies

1 | INTRODUCTION

In this paper we examine the role of the entrepreneurial university in the post conflict context of Rwanda, where genocide resulted in the collapse of civil society, government, and other institutions. The purpose of our paper is to examine the role of the entrepreneurial university within the wider entrepreneurial ecosystem (EE) in a post conflict, transitional economy. Although our knowledge of EEs is developing rapidly (Cavallo, Ghezzi, & Balocco, 2019; Hechavarría & Ingram, 2018; Neumeyer & Santos, 2018; Stam, 2015), there is relatively little known about the role of the entrepreneurial university (Cunningham, Lehmann, Menter, & Seitz, 2019; Guerrero, Cunningham, & Urbano, 2015) as part of the wider EE in transitional economies.

However, we do know that entrepreneurial universities (Etzkowitz, 2013) are regarded as catalysts for regional and national economic development in developed economies because they are a natural incubator for potential entrepreneurs (Culkin, 2016; Guerrero, Urbano, Cunningham, & Organ, 2014; Trequattrini, Lombardi, Lardo, & Cuzzo, 2018; Urbano & Guerrero, 2013). In a post conflict context understanding the role of the entrepreneurial university is critical for rebuilding of civil society and institutions, and thus reducing the possibility of a return to future conflict (Ishiyama & Breuning, 2012). However, the role of the entrepreneurial university is under-researched and the challenge, post conflict, is significant. Entrepreneurial universities have to carefully balance post conflict peace building with supporting the humanitarian and economic needs of local and regional

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communities, as well as recreating learning environments that supports the integration of those involved directly and indirectly in conflict (Feuer, Hornidge, & Schetter, 2013). Existing studies of EE building have posited an evolutionary process by which EEs emerge and change over time (Cohen, 2006; Colombelli, Paolucci, & Ughetto, 2019; Mack & Mayer, 2016).

In adopting a post conflict context—Rwanda—where genocide has resulted in the collapse of civil society, government, and institutions, we set out to examine the role of the entrepreneurial university in supporting the development of a wider EE in a post conflict in a transitional economy. Rwanda is an African country that shares its borders with Uganda in the North, Burundi in the South, Democratic Republic of Congo, and Tanzania in East and West respectively. A recent estimate of its population is in excess of 12 million people with 41% being under the age of 30 (National Institute of Statistics of Rwanda, 2017). The 1994 Genocide devastated the Rwandan economy and society. It also exacerbated a number of development constraints, which existed before 1994 including, low subsistence agriculture productivity, natural barriers to trade, high public debt, poor infrastructure, severe shortage of professional personnel among other challenges. Genocide devastated a generation of trained teachers, doctors, public servants, and private entrepreneurs along with its societal, political, and economic fabric.

Our paper makes two main contributions. First, we identify from our findings that in a post conflict, transitional economy entrepreneurial universities contribution to EE development is constrained by a number of institutional factors including, *structures, systems, leadership, strategies, and culture*. We further identify through our findings that, when an EE system has been destroyed during conflict, these constraints present significant challenges to the evolution of the EE post conflict. Second, in a departure from other studies of EE (Colombelli et al., 2018; Mack & Mayer, 2016), we offer a contextual contribution, outlining the role of the entrepreneurial university in the unique evolution of the post conflict EE in Rwanda. In post conflict transition economy we identify that the EE evolves through a number of stages including, *embryonic, destruction, formation, and capacity building* and the role that the entrepreneurial university contributes through this evolution.

Our paper is organized as follows; section one begins by reviewing the literature on EEs and the role entrepreneurial universities play in it. We then present our methodology and outline the situational and contextual factors associated with Rwanda. In our findings section, we present the evolution of the national EE from the period before genocide to after. We conclude the paper with a discussion and outlining the main contributions of this exploratory study.

2 | LITERATURE REVIEW

2.1 | Entrepreneurial ecosystems

The concept of ecosystem applied in entrepreneurship relates to the capacity of a territory to create a system of interdependent,

heterogeneous elements, and supporting infrastructure to bring about conducive environment for new ventures to flourish (Cavallo et al., 2018; Hechavarría & Ingram, 2018; Stam, 2015; Neumeyer & Santos, 2018). Recently attention has been drawn to the potential for African entrepreneurship to support economic development (Etuk, Etuk, & Michael, 2014; Vermeire & Bruton, 2016). However, the challenge of sustainable economic development is exacerbated by the often limited capacities of African governments to support entrepreneurship within the formal economy (Pattinson & Wanjiru, 2020) because of entrenched socio-economic challenges including, political instability, corruption, infrastructure deficits, and, in particular, a lack of institutional support (London, Anupindi, & Sheth, 2010; Prahalad & Hammond, 2002), all of which present challenges for the development of an effective EE.

An EE can be defined as a community consisting of many independent actors (governments, universities, investors, mentors, service providers, companies) that can play a key role in the development of entrepreneurial activities for a given geographical area (Hechavarría & Ingram, 2018). Here, context is a significant element of the EE (Autio, Kenney, Mustar, Siegel, & Wright, 2014) and the “variable” space, therefore, needs to be considered (Bhawe & Zahra, 2019) in order to develop an understanding of the role of actors. However, the concept of the EE is not clearly understood and different scholars and policy makers have applied a variety of meanings to it (Cavallo et al., 2018). For example, the literature on EEs has identified a range of actors and supporting institutions that encourage and support formally and informally entrepreneurial activities and their diffusion (Cunningham, Guerrero, & Urbano, 2017; Cunningham, Menter, & Wirsching, 2017; Nicotra, Romano, Del Giudice, & Schillaci, 2017) within EEs. Others have indicated different elements that contribute to successful and productiveness of the EE. Some these elements include, access to finance, government support, and policies the presence of government supported entrepreneurship programs, entrepreneurship education, infrastructure, market dynamics associated with change and openness, ease of entry regulations to start a business, and protection of intellectual property rights (Cohen, 2006; Feld, 2012; Hechavarría & Ingram, 2018; Isenberg, 2011; Mazzarol, 2014; Neck, Meyer, Cohen, & Corbett, 2004; Nicotra et al., 2017; Pattinson & Wanjiru, 2020; Suresh & Ramraj, 2012; Spigel, 2017).

Recent studies on EEs have begun to conceptualize the evolutionary and dynamic nature of ecosystems (Cantner, Cunningham, Lehmann, & Menter, 2020). Accordingly, EEs are not static but evolutionary, going through phases from inception, growth, consolidation, and decline (Colombelli et al., 2019; Mack & Mayer, 2016). The inception, or creation stage, refers to the emergence of an EE system where actors begin to network. This stage is characterized by a main actor that takes responsibility for the stewardship of the ecosystem. The governance of the EE at this stage revolves around a main actor (Colombelli et al., 2019). There are more firm births than there are deaths or exits, and the overall number of start-ups increases (Mack & Mayer, 2016). The growth stage is characterized by an emergence of a more complex and specialized network systems with multiple actors that interact without a central actor shaping the governance system.

Other peripheral actors become central actors and contribute to the governance, dynamism, and adaptation of the ecosystem (Colombelli et al., 2019). At the consolidation stage, the governance system becomes self-sustaining as actors are self-reinforcing due to the strong interconnections and feedback effects. However, market opportunities for start-ups begin to decline leading to overall decline in new ventures (Mack & Mayer, 2016). A variety of frameworks have been put forward to explain the interactivity and relationship between EE elements (Isenberg, 2010; Spigel, 2017; Stam, 2015; Suresh & Ramraj, 2012). Isenberg (2010), for example, argues that there is no formula to create a successful EE, but suggests nine principles that governments can use as guiding principles that can be adapted to create sustainable ecosystem and vibrant business sector. In the final stage, decline, networks, market connections, and entrepreneurship support disappear. Entrepreneurial failure at this stage is high and there is inadequate policy support for start-ups (Mack & Mayer, 2016).

In the extant literature, the EE and entrepreneurial university concepts have been developed through the lens of developed economies that have well-developed institutional structures (Audretsch & Belitski, 2017; Isenberg, 2011; Neck et al., 2004; Roundy, 2017). In developed and non-conflict economies, entrepreneurial universities play an enhanced role in economic development through research commercialization for economic or social good and the application of research outcomes to address social or economic challenges (Guerrero et al., 2015). In the literature, universities are considered as the central actor during the birth phase of an EE (Colombelli et al., 2019). To date, however, the EE concept has placed little emphasis on their role in transitional economies that have experienced significant economic and social disruption. Moreover, there have been limited studies examining the evolutionary aspect of EE processes in a post-conflict setting. Our study, therefore, seeks to address this gap by examining the role of the entrepreneurial university in supporting the development of a wider EE in a post conflict in a transitional economy.

2.2 | Entrepreneurial universities

The traditional mission of university has been on the transference of knowledge through education and advancement of new knowledge through research, (Lombardi, Massaro, Dumay, & Nappo, 2019; Philpott, Dooley, Amp, Reilly, & Lupton, 2011). The entrepreneurial university's role now involves a third mission—an *entrepreneurial* role—and they play a significant role in the evolutionary process of EEs (Cunningham, Guerrero, & Urbano, 2017; Cunningham, Menter, & Wirsching, 2017; Guerrero & Urbano, 2012; Guerrero et al., 2015; Urbano & Guerrero, 2013). Especially, at the emergent stage of the ecosystems, universities serve as anchor tenants that generate and disseminate knowledge within the ecosystems to facilitate its growth (Cantner et al., 2020). At this stage, universities play a central role not only in creating knowledge, but in the knowledge transfer process through other intermediary firms (Colombelli et al., 2019; Mack & Mayer, 2016). In the context of developed economies, entrepreneurial

universities are regarded as catalysts for regional economic and social development through knowledge spill-over and spinoffs based on endogenous theory which attribute the economic growth to policy measures such as subsidies, support measures, or incentives (Culkin, 2016; Guerrero et al., 2014; Guerrero et al., 2015; Trequattrini et al., 2018; Urbano & Guerrero, 2013).

However, in transitional economic contexts little is known if they are regarded as economic and social catalysts in supporting and contributing to the evolution of EEs. In post conflict situations the role of universities is focused rebuilding campuses, university activities, recreating knowledge around teaching and research activities as well as being involved in peace building efforts (Feuer et al., 2013) rather than directly on entrepreneurial activities. Moreover, in such situations universities are involved in efforts to rebuild relationships between conflicting parties as well as contributing to local and regional development efforts (Bergan & Van't Land, 2010; Johnson, 2013). Studies of Higher Learning Institutions (HLIs) in Kenya and Colombia have highlighted that they were involved in peace building efforts during conflict stages as well as post conflict (Pacheco & Johnson, 2014). Heleta (2017) argues that in post conflict situation that universities are essential in rebuilding capabilities across professions as well as for civil and public services.

In an entrepreneurial society, Guerrero et al. (2014) argue that knowledge and technology transfer occurs when the experiences of actors influence the behavior and activities of others. This has also been acknowledged by Cacciotti and Hayton (2015) and Cacciotti, Hayton, Mitchell, and Giazitzoglu (2016) who argue that the presence of successful entrepreneurs (role models) alleviate the fear to engage in entrepreneurial activities, and encourage government policies (Audretsch & Belitski, 2017), ease access to finance (Schwienbacher, 2013), and business support (Ács, Szerb, & Jackson, 2013). Entrepreneurial universities also contribute to the research and development (R&D) capability of the economy through the production of skilled workers with entrepreneurial mind-set capable of coping with uncertainty and complex current working environment, transfer of technology, and its application from academia to industry (Philpott et al., 2011). Given the paucity of research on the role of entrepreneurial universities in transitional and post conflict economies, our focus now turns to how entrepreneurial universities can contribute to the evolution of the EE.

3 | METHODOLOGICAL CONSIDERATIONS

Given our research context and focus is to examine the role of the entrepreneurial university in supporting the development of a wider EE in a post conflict in a transitional economy (before and after 1994 Rwanda Genocide), we selected a case methodology as the most appropriate approach for this study (Baxter & Jack, 2008). Studies of entrepreneurial universities have taken a case study or multiple case studies approach that have allowed for cross case analysis that have contributed to the extant literature (Bronstein & Reihlen, 2014; Ranga, Debackere, & Tunzelmann, 2003; Dabic, González-Loureiro, &

Daim, 2015; Guerrero et al., 2014). Our study is set in Rwanda and we purposefully selected universities that possessed some of the conditioning factors posited by Urbano & Guerrero (2013) and that were based in both urban and rural contexts. Table 1 provide an overall summary of each entrepreneurial university.

We used a systematic approach to data gathering across all entrepreneurial universities case studies. Field notes by one member of the authoring team who visited Rwanda in October 2019 also complimented our data collection. This further supported triangulation of the case data and findings with respect to reliability and validity (Yin, 2009). With respect to our data, we developed a cross case analysis to identify common themes and patterns, and through an iterative process, a deep understanding of the data. In the next section we outline our findings.

4 | FINDINGS

Analysis of our findings we have identified a number of institutional constraints on the entrepreneurial university and ecosystem development as well as its evolution post conflict.

4.1 | Institutional constraints on the entrepreneurial university to EE development

Our findings illustrate how in a post conflict, transitional economy the role of the entrepreneurial university in EE development is constrained by a number of institutional factor constraints including, *structures, systems, leadership, strategies, and culture* (Table 2).

4.1.1 | Structures

We found some evidence of strategy in Rwandan HLIs, such as Industrial Liaison Office, Business Incubation Centre and Technology Transfer Office most of which are physically situated within universities compounds. Some Rwanda universities have high levels of security and controlled access to their campuses. Structural elements that facilitate knowledge exchange (Technology Transfer Offices, incubators, Industry Liaison Offices etc.) are not prevalent across in the HLIs in our study and indeed across Rwanda. This deficiency in structure has resulted in poor university-industry relations in terms of curricula design, curricula delivery and skills development. In our study University of Rwanda has a number Centers of Excellence as way to capture new knowledge and practice in order to improve its service offering to industry. INES-Ruhengeri and two of eight Integrated Polytechnic Regional Colleges have business/innovation incubation centers that are helping respective institutions advance their entrepreneurial mission. More broadly in 2015 Global Human Resource Development Centre PVT LTD (GHRDC) 2015 carried out an assessment of HLIs in Rwanda in which 29 institutions participated. They found that 31% of HLIs have incubation centers, 24% produce entrepreneurs, only 14% provide placement assistance to their students, 59% consult industry to update or revise their course curriculum, and no HLI has applied for any patent in 2014 (GHRDC, 2015).

4.1.2 | Systems

We did find evidence among our case study entrepreneurial universities where they had set up bilateral collaborative arrangement with

TABLE 1 Selected universities

Name of institution	No of campuses	No of students	No of staff	When established	Source of income
University of Rwanda	14	28,125	2,702	2013	State budget allocations Government or partners' subsidies Income from its services Income from its investments Interests from its property. Loans granted to UR approved by the minister in charge of finance and economic planning Donations and bequests
Adventist University of Central Africa	3	N/A	N/A	1984	N/A
Rwanda Polytechnic	8	107,501 (2017)	Not reported	2017	State budget allocations; Government or partners' subsidies; Income from its services; Incomes from its investments; Proceeds from its properties Loans granted to RP approved by the minister in charge of finance; Donations and bequest
INES Ruhengeri	1	6,508 (2019)	N/A	2003	School fees Income from projects

TABLE 2 Synopsis of Evolution of Entrepreneurial Universities

Institutional factor constraints	Pre genocide	Post genocide	Reconciliation
Structures	HLI had the basic physical resources designed to facilitate traditional organizational roles (teaching and research). There were no structures through which faculty, staff, and students could interface with actors outside the university and vice versa. Structures were designed to produce graduates who were job seekers not job creators	As result of almost total devastation of physical resources, new structures were built to meet HLI traditional roles (teaching and research) but lacked facilities to promote and enhance interactions with actors outside HLI perimeter fences. This is because the priority was to get such institution back in operation and also depended on other elements of entrepreneurial architecture. For security reasons access to most HLI campuses was highly restricted with the presence of physical barriers such as walls and big fences and points of entries guarded by security personnel	Structures such business incubation centres, technology transfer office and industry liaison offices, centres of excellence among others are now being established to facilitate knowledge and technology transfer. Their effectiveness and level of engagement are being conditioned by university systems, strategies, leadership, and culture. The presence of physical barriers and manned points of entries deters external actors to engage with HLI as structures such as TTO and incubation centres are located within the campuses. UR has 14 campuses in different parts of the country with numerous facilities. INES-Ruhengeri has one campus and has physical resources which include business incubation Centre, interdisciplinary competence Centre for Regional Development, career advisory Centre, and language Centre. AUCA has 2 campuses in different parts of the country. RP has 8 colleges across the country with various facilities; mechanical and electrical workshops, business incubator.
Systems	There were no structures in HLIs to facilitate interaction between academic community and actors outside the campus impeded knowledge and technology transfer as the concept of entrepreneurial universities was not understood or considered.	There were no structures in HLIs to facilitate interaction between academic community and actors outside the campus impeded knowledge and technology transfer. The role of industry in academia or the contribution of HLI to industrial development was poorly understood therefore not encouraged.	As structures are being developed so are the networks of communication and their coordination some of which are decentralised. The presence of physical barriers still exist and INES-Ruhengeri academic departments are encouraged to create external linkages with industry and the Office of Vice Chancellor oversees the activities. Lack of close collaboration between HLIs and industry has had adverse implication on knowledge spill-over and creation of spin-offs on the back of research outcome application.
Leadership	The organisation structure of HLIs were hierarchical and often bureaucratic. The leadership team in many HLI composed of individuals, governing boards, and departments with strategy for organizational growth but the third mission was not part of organization goals	The leadership team in many HLI composed of individuals, governing boards, and departments with strategy to re-establish the institution with minimal human, physical and financial resources. The main priority was to get such institutions running again and develop human capital. AUCA re-opened in 1996, INES-Ruhengeri was established in 2003, UR in 2013 and RP in 2017	HLIs adopted collegial governance as opposed to hierarchical governance to enhance HLIs operations and engagement with internal and external actors. The leadership team in many HLI composed of individuals, governing boards, and departments with the ability to drive and steer the development of their respective institution. INES Ruhengeri has the autonomy from the state in respect of teaching, research, administration

(Continues)

TABLE 2 (Continued)

Institutional factor constraints	Pre genocide	Post genocide	Reconciliation
			and management its resources. It has UR and RP are public-funded institutions and the extent to which key actors can shape and alter structures and processes, and to the strategic vision that governs organizational evolution is relatively limited.
Strategies	The HLI organizational goals were mostly to develop human capital due to high levels of illiteracy with less emphasis on entrepreneurship.	There were no strategies towards third stream activities outlined in corporate plans and other guiding documents in the aftermath of genocide as the focus was placed on reconciliation and the development of human capital through university traditional role. There is no reward system (monetary or non-monetary) for academic staff who are engaged in entrepreneurial activities	Some HLIs have adapted their organizational goals and align them with government objection plans as elaborated in Vision 2020 which is to transform the country from agriculture-based economy to knowledge-based economy. The visibility of indicators of organizational approaches to the third mission is not prevalent in all HLIs even among colleges under similar governing body. There is no reward system (monetary or non-monetary) for academic staff who are engaged in entrepreneurial activities UR and RP rely on state budget allocations and have little diversified source of funding. School fees is main source of funding (65%), private funding (35%) for INES Ruhengeri
Culture	Attitudes of individuals within HLI and the value they place on innovation and their entrepreneurial orientation was very low. Entrepreneurial activities were mostly necessity-driven and entrepreneurship was not considered as viable career option	Entrepreneurial culture is beginning to shift towards entrepreneurship mainly due to external factors—Government policies to promote entrepreneurship, the emergence of services to support entrepreneurial activities. INES Ruhengeri was established in 2003 and was set up under main pillar; (1) building signs of hope, (2) contributing to unity and reconciliation and (3) contributing to the country's sustainable development.	Attitudes of individual within HLI is gradually changing to favor entrepreneurship due to the status ascribed to successful and serial entrepreneurs that are acting as role models HLIs are acknowledging the importance of culture to invoking third stream activities, and are making the association between cultural change and entrepreneurial systems and strategies

Abbreviations: AUCA, Adventist University of Central Africa; HLI, Higher Learning Institution; RP, Rwanda polytechnic; TTO, Technology Transfer Office; UR, University of Rwanda.

international institutions, who they can learn from to support building of institutional systems. For example, University of Rwanda established bilateral collaborations with Sweden and collaborated with numerous government agencies such Rwanda Development Board. More widely the GHRDC (2015) indicates that 69% of HLIs have affiliations with international institution/universities. In relation to university industry engagement we found evidence of limited engagement. Some institutions are graduating students who have had little exposure to the industry they want to work in. The absence of industry input in curricula design and delivery has a negative implication to entrepreneurial orientation as indicated by

Fiet (2001) and the capacity to entrepreneurial universities to contribute to EE building.

4.1.3 | Leadership

We found some evidence of leadership focus on third mission activities and the broader contributions of their institutions can make beyond to EEs. The leadership and institutional focus tends to be more on teaching and research some of which is more applied to meet local economic and societal needs. However for example, INES

Ruhengeri has made progress in establishing structures and systems to drive its entrepreneurial mission whereby each department and its academic members have the autonomy to pursue and establish external linkages with industry based on the departmental vision that feeds into the overall vision of the institution and the leadership is the driving force. This approach has facilitated INES Ruhengeri to steer and drive its third mission and it is now renowned for its academic excellence and high quality of graduates that are highly employable. However, more widely among Rwanda's institutions there seems to be limited focus leadership which respect to third mission activity and this reflected with only 3% of institutions have patent, 24% have laboratories sponsored by the industry, and 28% providing consultancy work to industry (GHRDC, 2015).

4.1.4 | Strategies

We found that some of the HLLs' mission statements can appear ambiguous or not "entrepreneurial" in orientation, while others have clearly set out their mission and their contribution to the society and economy. For example, the University of Rwanda's vision is:

"To develop highly enterprising graduates prepared and dedicated to building a more just and sustainable society locally, nationally and globally, with appropriate innovations that advance quality of life." INES-Ruhengeri's vision is "To provide specialised education through research in collaboration with civil society, private sector and public sector to the national and regional development, in order to create competitive enterprises and well-paid employment."

This mission statement reflects wider conflict resolutions activities in terms of being entrepreneurial and rebuilding civic society along with meeting economic needs. Whereas Rwanda Polytechnic briefs its vision is: "To provide applicable practical skills to its students to create jobs or compete in labour market." and this is focused on addressing immediate economic needs given the high poverty levels in Rwanda. The entrepreneurial vision of these HLLs are similar in terms of what they are aspiring to achieve—equip its graduate with applicable and relevant skills; critical skills of problem-solving, analytical thinking, and communication which are a pre-requisite for success, not just in entrepreneurship, but also in the wider business context. They also acknowledge their pivotal role in applying research and innovation to address socio-economic problems. The overriding challenge in implementing such strategies is the lack of sufficient resources. In terms of strategies what we did find in our case study entrepreneurial universities is a strong focus on teaching mission. We found that traditional teaching methods are more predominant by some institutions are adopting new experiential teaching methods that enable students develop critical thinking and communications skills that are a pre-requisite for success, not just in entrepreneurship, but also for wider institutional building. However, Rwanda still faces challenges in this regard. A recent report from Higher Education Council found that

five private HLLs in the country have been closed permanently over inadequate staff and lack of enough training facilities, among other requirements after an external audit by the government to assess challenges affecting HLLs.

4.1.5 | Culture

Institutional culture is a key determinant of the type of entrepreneurial activities the institution engages in based on the attitude of individual towards entrepreneurship, the value they place on research and innovation and the propensity to engage in entrepreneurial activities. Culture and embedded practices reflect the readiness and flexibility of HLLs in the pursuit of the third mission. Poor linkage between universities and industry has hindered mind-set change among graduates as entrepreneurship. Also, there is a cultural mismatch between university and industry expectations. This has led to high levels of graduate unemployment and under-employment as well as high failure rate among nascent entrepreneurs. One reason for this cultural mismatch could be attributed to the fact that University of Rwanda, Adventist University of Central Africa and Integrated Polytechnic Regional Colleges have minimal linkages with the productive sector at various levels. Moreover, in Rwanda entrepreneurship is still regarded as a very high-risk endeavor.

We found an absence of role models or entrepreneurial guest speakers and this hampers the creation of an entrepreneurial culture among students and on campuses. Also, we found little evidence of role model for entrepreneurship and how faculty were encouraged or even rewarded to engaging in their mission activities. The absence of incentives for those who engage in entrepreneurial activities is an inhibiting factor. To ensure success, the entrepreneurial university needs to engage and collaborate with industry and government in order to contribute effectively to the EE. In Table 3 we chart the evolution of the entrepreneurial university's main ecosystem actors (industry, government, and academia) in Rwanda from pre conflict to post conflict.

Next, we outline the role of the entrepreneurial university in the evolution of the EE.

4.2 | EE building as an evolutionary process

Analysis of our findings revealed the evolution of the entrepreneurial university in the context of the post conflict EE in Rwanda, enabling us to identify how the EE evolves through a number of stages; *embryonic*, *destruction*, *formation*, and *capacity building* and the role that entrepreneurial universities play in contributing to EE development.

4.2.1 | Embryonic stage

The first stage is the *embryonic stage* and is identified as occurring prior to the conflict in Rwanda. During this stage, entrepreneurial

TABLE 3 Entrepreneurial University Main Ecosystem Actors

EE actors	Pre genocide	Genocide	Post genocide	Reconciliation
Government	<p>The government was development-oriented, 60% of the population lived below the poverty line, and almost half of the population was illiterate, huge public debt. (Institute of Policy Analysis and Research, 2012)</p> <p>Government economic position was weakened by economic crises in late 1980 due to tin market collapse in 1985, 50% reduction coffee prices and the fall of coffee exports from \$144 million in 1985 to \$30 million in 1993. Tin and coffee were the country's largest foreign-exchange earner.</p> <p>Real GDP fell by 10% between 1989 and 1993, and inequality increased as the percentage of income held by the top 10% rose from 10% in 1982 to 41% in 1992</p> <p>The situation was exacerbated by ineffective government policy that guaranteed coffee prices to farmers through the coffee equalization fund.</p> <p>Foreign aid was 22% in 1991 and accounted for more than ¾ of capital expenditures. (Porter & McCreless, 2008)</p>	<p>Almost all government institutions were not functional as some of employees participated in the killings and others being killed or in hiding. In 100 days (between April to June 1994) more than 800,000 people are estimated to have perished—about 10% of the population lost their lives</p> <p>The genocide led to the destruction of manpower, capital stock, and resources such as livestock, as well as a total absence of the state. In the process, much of the social capital was destroyed and a climate of uncertainty became prevalent</p>	<p>Rwanda began to reform its economy in 1995. The GoR implemented a comprehensive reform program to reduce poverty and support growth—PRSP focused on social sector development to lay the foundation for improved service delivery for human development and growth. The reforms also focused on exchange and trade regime, privatization of state enterprises, reform of public administration, budget and financial management, and private sector development.</p> <p>Policy reforms on economic transformation included the liberalization of the monetary and financial sector led to the adoption of new currency exchange regulations, the creation of new private commercial banks, and the privatization of banks that were previously state-owned, flexible exchange rates were introduced and tariffs were also reduced considerably with the average rate decreasing to 18%. These reforms resulted in substantial achievements in the economic sector</p> <p>GoR benefited from substantial aid inflows to support the country's economic recovery. Total ODA indicated foreign aid contribution to GDP was 95% in 1994 and dropped to 19.2% in 2004 as the country progressed from a period of reconstruction and stabilization toward sustained growth.</p> <p>World Bank issued a grant of \$20 million to Rwanda in July 1994. In 1995, Rwanda received more than \$705 million in aid that constituted 54.5% of Rwandan GDP. 1995 to 2000, European Commission provided \$159 million to Rwanda to rebuild key infrastructure that would stimulate economic recovery. As a result of implementation of structural and economic reforms with the support of international agencies, the economy grew at an average rate of 9.8% per year (Porter & McCreless, 2008)</p>	<p>Rwanda Vision 2020 was developed as guiding principle to fundamentally transform the country from agrarian-based economy into a middle-income country by the year 2020. This vision was built on 6 key pillars to bring about conducive environment for the country to continued economic recovery (Ministry of Finance and Economic Planning, 2020).</p> <p>The long-term Vision 2020 was implemented through the medium-term planning framework of the Rwanda's EDPRS for successive five-year periods and ESSP.</p> <p>ESSP is built upon the national priority to make education at all levels more accessible and more relevant to our national needs. ESSP corresponds with the second EDPRS, covering the period 2013/14 to 2017/18 (Ministry of Finance and Economic Planning, 2013).</p> <p>EDPRS is the mid-term framework to implement the Government's long-term development agenda based on three pillars designed to accelerate economic growth and promote human development; (Ministry of Finance and Economic Planning, 2007). Under EDPRS 1, priority was given to accelerating growth, creating employment and generating exports, EDPRS 2 overarching goals was to accelerate progress to middle income status and better quality of life for all Rwandans through sustained GDP growth and accelerated reduction of poverty.</p> <p>The Implementation of reforms on economic transformation pushed Rwanda up to the ranks of world's top performer in the World Bank's Ease of Doing Business Index in 2010 (World Bank's Ease of Doing Business Index, 2019; 2010). This ranking indicates that the government is taking action to make the local regulatory environment more conducive to doing business</p>

TABLE 3 (Continued)

EE actors	Pre genocide	Genocide	Post genocide	Reconciliation
Industry	<p>About 90% of the population dependent on subsistence farming, commercial farming was dominated tea and coffee exports, which are susceptible for price fluctuation.</p> <p>Low contribution on industry and manufacturing sector to the country GDP. 1985 economic crisis was caused by a combination of declining Governance and economic policy failure, aggravated by the collapse of world coffee prices</p>	<p>All economic activities ceased due to killings taking places all over the country.</p> <p>Rwandan genocide led to an immediate drop in GDP by 58%, physical, poorly developed productive infrastructure and social structure were destroyed on a massive scale and skilled human capital had either fled the country or been killed.</p> <p>The Rwanda population was slightly over 6 million in 1994 before the genocide. Over 2millions people took refuge in neighboring countries. During late 1994 and throughout 1995, more than 700,000 long-time, Tutsi refugees returned to Rwanda (United States Committee for Refugees and Immigrants, 1997)</p>	<p>Following the genocide and almost total destruction of infrastructure and huge loss of human capital, there was 50% decline of real GDP in 1994, in 1995 real GDP growth was 37%, and then averaged 12% in 1996 and 1997. The estimate of real GDP growth for 1998 was 10%.</p> <p>As a result of stringent fiscal and monetary policies, inflationary pressures were contained, and the inflation rate has declined from 62% in 1994 to 2.5% in 1998. In 2002, the agricultural sector contributed 47% of GDP, industry 18% and the service sector 36% (Bigsten & Lundström, 2004).</p> <p>In 1990, Rwanda's total FDI was about US\$ 7.7 million, during the conflict in 1994, FDI inflows fell to zero (No, Muhammad, Tamwesigire, & Mugisha, 2008). When stability was restored, FDI inflows increased and reached US\$320 million in 2015, equivalent to 4% of GDP. Much of the investment went into the domestic service sector—finance and telecommunications (English, McSharry & Ggombe, 2016)</p>	<p>Rwanda is now hailed for its economic recovery after the genocide—Share of industry and services to GDP has increased from 14 and 44% in 2000 to 16% and 46% in 2011</p> <p>Economy grew on average 7.5% over the decade to 2018 while per capita growth domestic product (GDP) grew at 5% annually. Service sector contribution to GDP rose from an average of 38% in the period 2001 to 2005 to a contribution of about 46% in 2010, the contribution of manufacturing sector increased from 12.7 to 13.9% whereas agricultural contribution decreased from 43 to 35% in the same period (Institute of Policy Analysis and Research, 2012)</p> <p>GoR has made significant progress in rebuilding economic and social infrastructure and is internationally held as committed to good governance</p>
Academia	<p>There was only 13 higher learning institution in the country. Intake was relatively low but gradually increasing (921 in 1980, 1,572 in 1985)</p> <p>NUR had only 2 campuses. In the early 1990's, the expansion of the system saw public and private enrolment rising to about 5,000 students.</p>	<p>All higher learning institutions and vocational training centers were destroyed, or non-functional.</p> <p>Teachers and children were killed or fled; schools and colleges were destroyed, burned, looted and pillaged, and their properties stolen or destroyed.</p> <p>The National Archives lost all its documents. The National Library was burned down.</p>	<p>The government gave the highest priority to the re-establishment of the one public university. NUR consolidated the two campuses into one campus for the immediate future, due to reasons of cost and security.</p> <p>National funds were made available to recruit and remunerate regional and international staff in order to ensure the functioning of the university, and urgent appeals went out to bilateral and multilateral organizations to provide further funding for the university, for other government institutions of higher education and for the immediate development of higher institutions in the private sector</p> <p>Tertiary education was very small, and research at the university was practically non-</p>	<p>Different private Higher Learning institutions entered the industry or re-opened; AUCA that had temporarily suspended its activities since April 1994 re-open in May 1996, INES-Ruhengeri was established in 2003, NUR was re-structured in 2013, Rwanda Polytechnic was established 2017.</p> <p>UR mission and visions are aligned to Rwanda Vision 2020 and EDPRS 2 Strategy whose objective is to increase the quality of life of all Rwandans through rapid and sustainable economic growth and accelerated poverty reduction (UR, 2018)</p> <p>Entrepreneurship-related programs have been or are being introduced. UR has made it mandatory for all</p>

(Continues)

TABLE 3 (Continued)

EE actors	Pre genocide	Genocide	Post genocide	Reconciliation
			<p>existent (Bigsten & Lundström, 2004). According to World Bank, 1990's enrolment in HLI was about 5,000 and in early 2000s enrolment increased to nearly 17,000 by 2001–02 (World Bank, 2003). Recent survey by The NISR indicate that the enrolment at HEIs in private institution is 43,717 (INES–3,399 students, AUCA–2363 students) and in public institution is 40,731 (NISR, 2015).</p> <p>UR has 6 colleges, 21 schools located in 10 different campuses across the country. INES Ruhengeri undergraduate programs include applied fundamental sciences; economics, social sciences and management; education and Faculty of law. Masters programs include; microfinance, taxation, cooperative management, entrepreneurship and SME management. AUCA undergraduate programs include; Faculty of Business Administration; Faculty of Education, Faculty of Theology, Faculty of Information Technology. Graduate programs include; master of education, master of business administration MBA. AUCA has also School of Nursing</p>	<p>undergraduate students to study entrepreneurship, RP is in process of incorporating entrepreneurship programs in its curriculum</p> <p>Academic productivity (number of research published) gradually increasing. INES Ruhengeri has its own scientific journal called <i>INES Scientific Journal (ISJ)</i> is a peer-reviewed journal of INES-Ruhengeri. INES has published around 148 academic articles between 2010–2019 (INES, 2019).</p> <p>AUCA academic research is published in its journal called <i>Journal of Inter-Discourse Academia (JIDA)</i>. Its research Centre conducts funded research work for public and private.</p> <p>UR has Internal journals and also publishes in <i>African Journals Online (AJOL)</i>. UR aspires to be an internationally recognized university that excel in research and innovation among other qualities as elaborated in its 2018–2025 strategic planning (UR, 2018)</p>

Abbreviations: AUCA, Adventist University of Central Africa; EDPRS, Economic Development and Poverty Reduction Strategy; EE, entrepreneurial ecosystem; ESSP, Education Sector Strategic Plan; FDI, foreign direct investment; GDP, growth domestic product; GoR, government of Rwanda; HEIs, Higher Education Institutions; HLI, Higher Learning Institution; IPAR, Institute of Policy Analysis and Research – Rwanda; NISR, National Institute of Statistics of Rwanda; NUR, National University of Rwanda; ODA, overseas development Assistance; PRSP, poverty reduction strategy program; RP, Rwanda polytechnic; SME, small medium enterprise; UR, University of Rwanda.

universities played a significant role in the economic growth of the country, and in supporting the establishment of an EE. Such entrepreneurial universities served as incubators of knowledge creation entrepreneurship, a primary focus during this stage (Cohen, 2006; Colombelli et al., 2019; Mack & Mayer, 2016). However, building a strong EE in such a transitional economy was hampered by ineffective government policies, low student enrolment at entrepreneurial universities and slow infrastructure development. Supporting institutions during this embryonic stage were weak and ineffective in facilitating networking of actors and the transfer of knowledge for entrepreneurial activities to adequately sustain the birth of a national EEs. Arguably, the government was considered the main actor in the

establishment and nurture of EEs through its programmes and incentives which were limited in scope. In addition, support structures through which university actors such as faculty, support staff, and students could network with actors outside the university (and vice versa) were limited.

4.2.2 | Destruction stage

The second, *destruction stage*, was the direct result of the conflict period in Rwanda (April–July 1994). Prior to the conflict, the establishment stage of the EE has been slow as described in the embryonic

stage. However, the conflict effectively destroyed any growth potential for entrepreneurial universities and the further establishment of an EE in Rwanda. The structures, systems, leadership, strategies, and culture, identified earlier, were effectively destroyed as a result of the conflict. This eliminated any potential for the development of an effective EE based on, and including, the pre-conflict entrepreneurial universities. More widely, the conflict resulted in the failure of government institutions and hence civil society, with a significant loss of human capital through genocide and citizens relocating, as refugees, to neighbors countries.

4.2.3 | Formation stage

The third stage, the *formation stage*, consists of a process of rebuilding idea of the entrepreneurial university in the aftermath of the conflict and was a period when universities focused solely on addressing rudimentary economic and civil society needs. Our study highlights that entrepreneurial universities focus at this time was on rebuilding physical resources and knowledge infrastructure, and in a practical sense on developing new degree programmes that were politically sensitive to conflicting parties and that met the development needs of the country at that time. In essence, during this stage there was a focus on rebuilding the university system but limited entrepreneurial activity from universities regarding their role in developing the wider EE.

4.2.4 | Capacity building stage

The final stage, is the *capacity building stage*, where the entrepreneurial universities begin to expand beyond the provision of teaching, to explore other, arguably more entrepreneurial missions such as research, and knowledge and technology transfer, necessary to re-establish and support the evolution of an EE. This capacity building stage is supported by elements such as developing an effective culture and strong, visionary leadership within an entrepreneurial university. Also, the lack of expertise and entrepreneurial behavior with respect to third mission activities can hamper capacity building efforts. However, there are early mover universities who are creating and delivering entrepreneurship-related programs and there is increasing networking of actors. To support capacity building and help re-establish an EE, government needs to support the development of entrepreneurial spirit through the expansion of entrepreneurial universities. Our study, therefore, reveals a non-linear evolutionary process involved in re-establishing an EE in a post conflict transitional economic context.

5 | DISCUSSION AND CONTRIBUTIONS

Our study found that the evolution of EE are different to that have been posited to date within the literature (Cohen, 2006; Colombelli et al., 2019; Mack & Mayer, 2016). Our findings demonstrate that in a

post conflict transitional the role of the entrepreneurial university in EE development is constrained by a number of institutional factors including, structures, systems, leadership, strategies, and culture. We establish that entrepreneurial universities in post conflict transitional economies need to support the immediate pressing economic and civil society needs of the country, which are focused on re-establishing institutions and economic activities to prevent a reoccurrence of the original conflict. Therefore, post conflict entrepreneurial universities are orientated toward rebuilding human capacity as a predominant focus, rather than on entrepreneurial activities such as developing research and technology transfer missions. In essence, entrepreneurial universities in post conflict transitional economies initially solely focus on rebuilding their teaching mission. Based on local needs entrepreneurial universities then slowly expand their research and technology transfer mission to meet the direct economic and social needs of their locality. Whereas previous studies of entrepreneurial universities in developed contexts have demonstrated first (teaching) and second (research) mission capabilities and activities do exist that can therefore be enhanced for their third mission (technology and knowledge transfer) capacity building depending on the ambitions of the entrepreneurial universities, its strengths, the local industrial sectoral configuration, and regional/national needs (Guerrero et al., 2015; Urbano & Guerrero, 2013).

Our study highlights entrepreneurial universities in post conflict transitional economies have aspirations to build their third mission activities and capabilities. However, this is constrained by the institutional factors and conditioning factors (environmental and internal—human, financial technological, social capital, status, and prestige) (Urbano & Guerrero, 2013). The development of third mission activities of entrepreneurial universities in post conflict transitional economies is in its infancy compared to more established economies and entrepreneurial universities. This is particularly true in the African entrepreneurship context of Rwanda. Moreover, in developed economies Guerrero et al., (2014:434) argues that “university authorities need to recognize their core role at this time as not only building but also enforcing the university entrepreneurship ecosystem” of entrepreneurial universities that enables them to fully participate in ecosystem building. Whereas are our study has found that the entrepreneurial universities in post conflict transitional economy context core role and task is building the university entrepreneurship ecosystem that in the short to medium term is to support conflict resolution, civil society, and economic needs. In essence, we argue that these are antecedent foundational elements in order for an entrepreneurial university to fully participate in EE building with other actors. Our findings demonstrate that EE development is an evolutionary process in a post conflict transitional economy. In a departure from earlier studies (Colombelli et al., 2019; Mack & Mayer, 2016) we have identified four distinct evolutionary stages of *embryonic*, *destruction*, *formation*, and *capacity building*. We therefore suggest that entrepreneurial universities need to adopt a more entrepreneurial orientation in order to re-establish an EE post conflict.

Our paper makes two significant contributions. First, we identify that in a post conflict, transitional economy, such as Rwanda, the

development of an EE can be constrained by a range of factors including, *structures, systems, leadership, strategies, and culture*. We further identify that, when an EE system has been destroyed through a conflict, such as the Rwandan genocide, these constraints present significant challenges to the re-establishment and subsequent evolution of an EE post conflict. Second, in a departure from the findings of other studies (Colombelli et al., 2019; Mack & Mayer, 2016), we offer a contextual contribution, outlining the role of the entrepreneurial university in the unique evolution process of re-establishing (post conflict) an EE in Rwanda. In a post conflict transition economy we establish that the EE evolves through a number of stages—*embryonic, destruction, formation, and capacity building* and the role that entrepreneurial universities play in contributing to EE development.

6 | CONCLUSION

6.1 | Managerial implications

Our study raises some relevant managerial implications. First, in a post conflict context, entrepreneurial universities play an anchor role for rebuilding the EE, initially through first mission activities—teaching. Whereas the anchor role of entrepreneurial universities in more developed economies is on using on missions to contribute to the EE with a particular focus on supporting entrepreneurship and third mission activities. In essence their anchor roles differ. Entrepreneurial universities in post conflict and reconciliation contexts need to take on wider national building roles of peace building, humanitarian, and development than just focusing on the creation of entrepreneurial capacity through their three missions. Some of these activities are rudimentary but require entrepreneurial universities to cut across conflicting parties to addresses immediate societal and economic needs within its locality. Second, policy makers and donor countries in post conflict situations need to appreciate that investing in developing incrementally different missions of entrepreneurial universities takes more time and it has to be contextual aligned to meeting the needs of local stakeholders that is sensitive to but not constrained or defined by conflict. Such an incremental approach is a necessary foundation to the re-establishment of a functioning and sustainable EE. Third, in such contexts entrepreneurial universities should seek international collaborative and bilateral support to accelerate their capacity to build research and third mission activities that are essential for any EE to grow.

6.2 | Future avenues for research

Our findings opens up some opportunities for new research avenues with respect to the study of the EE and entrepreneurial universities in post conflict and transitional economies. While we did find some limited examples of specific formal institutional structures that are designed to focus on supporting entrepreneurs and that attempts to

nurture “entrepreneurial potential” (Guerrero et al., 2014). This then raises an interesting question, to what extent do post conflict transitional economy entrepreneurial universities really need to adopt and imitate more developed economy entrepreneurial universities entrepreneurial architecture, and conditioning factors? Do they need to develop institutional structures and culture that is distinctively different to continue to reflect the economic and social environmental factors? How do they acquire the skills, expertise, capacity and competences to develop their third mission activities and contribute to EE growth? What mechanisms and institutional approaches should entrepreneurial universities use in transitional economies to build sustainable relationship with industry? In addition, our findings are context specific and as such they are not necessarily generalizable. Acknowledging the exploratory nature of this study and its contextual limitation, our study advances our understanding of how entrepreneurial universities contribute to EE building in a post conflict transitional economy. Moreover, there is a real and pressing need for more studies of entrepreneurial universities and EEs in less developed and transitional economies.

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